

AMENDMENTS TO THE SPECIFICATION

Please amend the paragraph beginning on page 1, line 10 as follows in marked-up form:

The present invention is generally directed to related apparatus and methods for the circulation of bodily fluids through the use of a reverse flow pump system. More particularly, the present invention relates to the transport of fluids between various body regions and the increased stabilization of body organs.

Please amend the paragraph beginning on page 3, line 23 as follows in marked-up form:

Alternatives to CPB are limited to a few commercially available devices that may further require major surgery for their placement and operation such as a sternotomy or multiple anastomoses to vessels or heart chambers. For example, some present day devices used in CPB may require a sternotomy and an anastomosis to the ascending aorta for placement. The main drawbacks of these devices include their limited circulatory capacity which may not totally support patient demands, and their limited application for only certain regions of the heart such as a left ventricular assist device. These types of devices typically require direct access to the heart region and open heart surgery. Other available devices that permit percutaneous access to the heart similarly have disadvantages such as their limited circulatory capabilities due to the strict size constraints for their positioning even within major blood vessels. Moreover, the relative miniaturization of these types of devices present a high likelihood of mechanical failure. In further attempts to reduce the physical dimensions for cardiac circulatory apparatus, or any other bodily fluid transport system, the flow capacity of these devices are significantly diminished.

Please amend the paragraph beginning on page 4, line 16 as follows in marked-up form:

Another significant disadvantage of surgical procedures on the heart and other fluid transport systems within the body is their inherent structural instability. The relative flexibility and wide range of movement of organ walls, cavities or the like often complicates delicate procedures that demand a stable operating platform. For example, the instability of unsupported cardiac walls, particularly when the heart is still beating, present significant challenges to the surgeon in performing CABG or other similar procedures. A

variety of tools or probes are currently used in an attempt to minimize the movement of a tissue wall, organ or cavity wall, such as the exterior heart wall, and is a well recognized method used during CABG surgery on a beating heart. For example, a probe may be used that consists of a forked pedal placed directly onto the surface of a beating heart. These devices and other similar implements simply compress the outside wall of the heart or any other ~~body~~ relatively unstable body surface to reduce its movement, and allows a surgeon to operate in a slightly more controlled environment. Other commonly used tools that provide similar functions may consist of a series of suction cups that uses suction force to suspend or hold areas surrounding the external surface of a surgical site in order to reduce undesirable movement. These and other known devices generally hold or immobilize only the external surface of an organ or unsupported wall to reduce movement at the surgical site.

Please amend the paragraph beginning on page 10, line 12 as follows in marked-up form:

Fig. 24 is a partial sectional view of the heart and a stabilization system used in cooperation with an extracorporeal pump.

Please amend the paragraph beginning on page 13, line 14 as follows in marked-up form:

A rotor 70 may be disposed longitudinally inside the inlet tube 55 as shown in Fig. 2. During operation of the fluid control apparatus in this configuration, the rotor 70 is rotated by the driving unit 80 through an opening or hole 54 in order to direct fluids such as blood from the inlet tube 55 out through the cut outs 57. The outside diameter of the inlet tube 55 is preferably smaller than the inside diameter of the housing body 52 which creates a passageway 59 between the inlet tube 55 and the housing body 52. A housing cap 60 is attached to the distal opening of the housing body 52. The housing cap 60 may include a circular or disc shaped base member 61 designed to fit over the housing body 52. A cylindrical inlet neck 62 may also be formed perpendicular to and centrally aligned to the base member 61. The outside diameter of the inlet neck 62 is smaller ~~then~~ than the inside diameter of both inner cannula 20 and the outer conduit 30 which forms another passageway 65 for the reverse flow of fluid such as blood. The inlet neck 62 may also be joined temporarily or permanently to the proximal opening 24 of the inner cannula 20 by bonding or welding, or may even be integrally formed. The passageway 59 and the outflow

windows 64 of the housing cap 60 may be aligned with passageway 65 when the housing cap is assembled with the housing body 52.

Please amend the paragraph beginning on page 15, line 19 as follows in marked-up form:

As shown in Figs. 5A-D, the housing body 52 is preferably tubular and includes a concentric inlet tube 55. When the housing body 52 and the inlet tube 55 are concentric and joined to a base plate 53, a passage 59 is thereby formed for blood or other fluid to flow within. The passage 59 of the housing body 52 and the outflow windows 64 of the housing cap 60 may be aligned when the housing cap and the housing body are assembled coaxially. The inlet tube 55 may comprise multiple cut-outs 57 at its proximal end to connect the passage 59 with the inlet tube 55. The profile of the inlet tube 55 is not necessarily cylindrical and may vary in shape to match the outside profile of the rotor 70. Both profiles may be matched and varied according to pump design, i.e. an axial pump may have a cylindrical profile or a centrifugal pump may have an overall conical profile. A clearance between the inlet tube 55 profile and the rotor 70 should exist to permit the rotor 70 to rotate without contacting the walls of the inlet tube 55. The inlet tube cut-outs 57 may be generally circular, and may depend on the rotor and pump category or application. The proximal end of the inlet tube 55 may be pressed into a matching groove 51 of the base plate 53. The base plate 53 may comprise a groove 51 that is preferably concentric with the base plate 53 circumference, and a central hole 54 that is preferably concentric with the groove 51. The outside diameter of the base plate 53 may be matched to the inside diameter of the housing body 52 to provide an interference fit to hold the base plate 53 and the housing body 52 together. The base plate 53 and the housing body 52 may be formed of a unitary part or of a multiple parts joined together by known techniques such as welding, bonding, or like techniques. The housing body 52 proximal end may be attached to the distal end of drive unit 80.